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Elm BARK BEETLES

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ELM BARK BEETLES

By T. H. Jones, *senior entomologist, Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine*

Two species of bark beetles commonly attack elm in the United States. One is known as the smaller European elm bark beetle (*Scolytus multistriatus* Marsh.) and the other as the native elm bark beetle (*Hylurgopinus rufipes* (Eich.)). So far as known to the author these bark beetles attack elm only. During recent years they have attracted special attention because of their association with the spread of the Dutch elm disease fungus (*Ceratostomella ulmi* (Schwarz) Buisman). When adults of either species issue from material in which the fungus is present they may carry it to recently cut or weakened and dying branches or trunks of elm, in which they form their galleries. The smaller European elm bark beetle is also known to inoculate healthy elm trees with the fungus through its habit of feeding in twig crotches.

Adults of the native elm bark beetle hibernate in the bark of living elm trees. When adults contaminated with the fungus penetrate into the bark of living trees to a sufficient depth, these trees may later become diseased. The adults of the smaller European elm bark beetle attempt at times to form galleries in trees that are too vigorous for the development of the larvae. In some instances they pierce the bark only, while at other times they make short galleries in which a few eggs are sometimes laid. Perhaps adults of the native elm bark beetle also do this. If such beetles are carrying the fungus, it may spread from the points where the beetles penetrate the inner bark.

The Smaller European Elm Bark Beetle

The smaller European elm bark beetle (*Scolytus multistriatus*) is, as its name implies, a native of Europe. It is known to have been present in the vicinity of Boston, Mass., as early as 1904 and has since been found in the following additional States: New Hampshire, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, West Virginia, Ohio, Kentucky, and Indiana. It may be present in other States or spread to them as time goes on.

How the smaller European elm bark beetle became established in the United States is not known. It has been found in burl elm logs consigned to veneer plants and in elm sticks used as crate material in cargoes arriving from Europe. Presumably, therefore, the insect first gained a foothold in one of these ways. Its subsequent spread is believed to have been aided by shipments of similar infested material originating both in Europe and in the United States. Infested material has also been carried by rivers, especially when they were at flood stage, and the beetle has thus been taken into new territory.

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Description

The adult beetle (fig. 1, *A*) is dark reddish brown, shining, and approximately one-eighth of an inch in length. The under side of the hind end of the body is concave, with a noticeable projection or spine protruding from the lower surface. The minute egg (fig. 1, *B*) is globular, shining, and pearly white. The larva (fig. 1, *C*) is a legless, white grub with a brown head, and is about one-eighth of an inch long when full-grown. The pupa (fig. 1, *D*) is approximately the same size as the adult but is white.

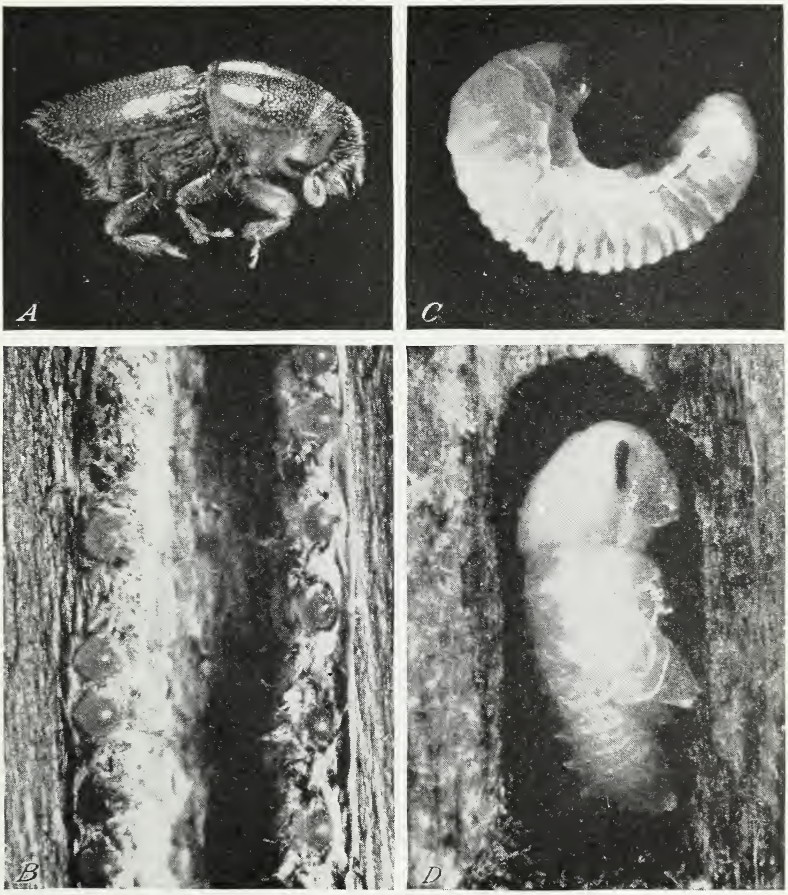

FIGURE 1.—The smaller European elm bark beetle: *A*, Adult (× 15); *B*, eggs (× 22); *C*, larva (× 13); *D*, pupa (× 15).

Life History

This insect passes the winter as a larva, or grub, in the bark. When warm weather comes, in the spring, the larvae complete their growth, transform to pupae, and later to adults, or beetles. The adults begin issuing late in May through small holes that they make in the bark (fig. 2). They continue to emerge during the warm months. The adults feed in the crotches of living elm twigs (fig. 3) and later bore through the bark of recently cut elm, or trees or parts of trees that have recently died or are in a dying condition. Egg galleries are formed in the inner bark, grooving the outer surface of the wood, and are constructed parallel with the grain of the wood (fig. 4). The female places her eggs in niches along the sides of the gallery (fig.

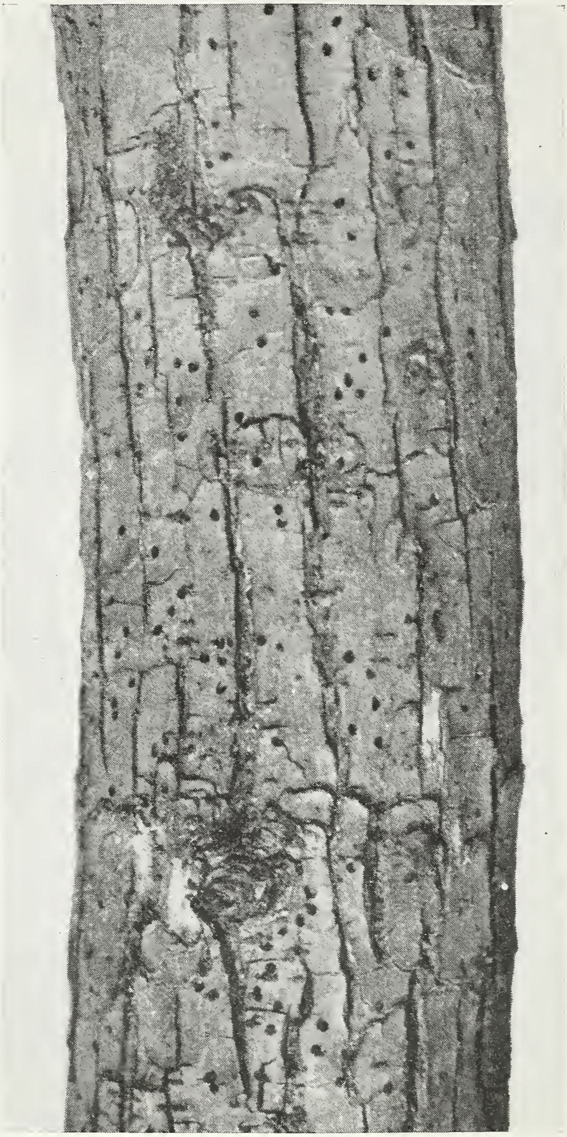

FIGURE 2.—Emergence holes made by adults of the smaller European elm bark beetle in elm bark (natural size).

1, *B*). The larvae, or grubs, that hatch from these eggs feed in the inner bark and the outer surface of the wood and, in so doing, they construct mines that extend at an angle from the egg gallery (fig. 4). When full-grown, the grubs construct cells in the bark and there transform to pupae. Eggs laid during the spring and early in the summer in New Jersey develop into adults during the same season, but the overwintering larvae usually develop from eggs laid late in the summer or early in the fall.

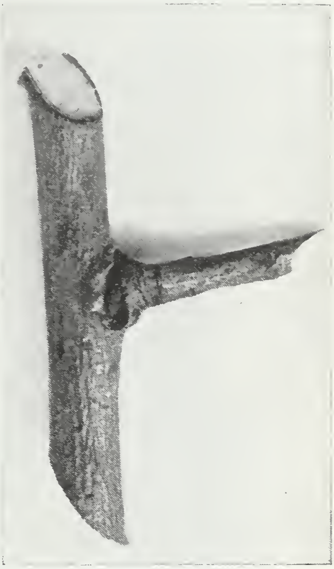

FIGURE 3.—Feeding scar in small elm crotch, made by an adult of the smaller European elm bark beetle (twice natural size).

The Native Elm Bark Beetle

The native elm bark beetle (*Hylurgopinus rufipes*) is so called because it is presumably a native of the United States. This insect occurs in the Eastern States from Maine to Virginia, Mississippi, Kansas, and Minnesota, and has been recorded in nearly all the intervening States. It has also been reported from Ontario, Canada. It may be present throughout the natural range of the American elm, which includes approximately the eastern two-thirds of the United States.

Description

The adult beetle (fig. 5) is brown and a little less than one-eighth of an inch long. It can be distinguished from the European species by its less shiny or duller appearance and by the absence of the concave outline and the spine near the hind end of the under surface (fig. 1, *A*). The egg, larva, and pupa closely resemble those of the European elm bark beetle in color and general appearance.

Life History

The native elm bark beetle passes the winter both as a larva in elm bark and as an adult. Most adults pass this season of the year in tunnels which they have previously made in the bark of healthy elm trees (fig. 6). Adults begin to appear early in May and make their egg galleries in the same kind of elm material as those of the smaller European elm bark beetle. While the galleries in which the eggs are laid are also constructed in the inner bark and outer wood, they extend normally across the grain of the wood (fig. 7) instead of parallel with it, and can thus be distinguished from the egg galleries of the smaller European elm bark beetle. The egg gallery of the native elm bark beetle usually consists of two branches diverging from the point where the parent beetles penetrated the bark.

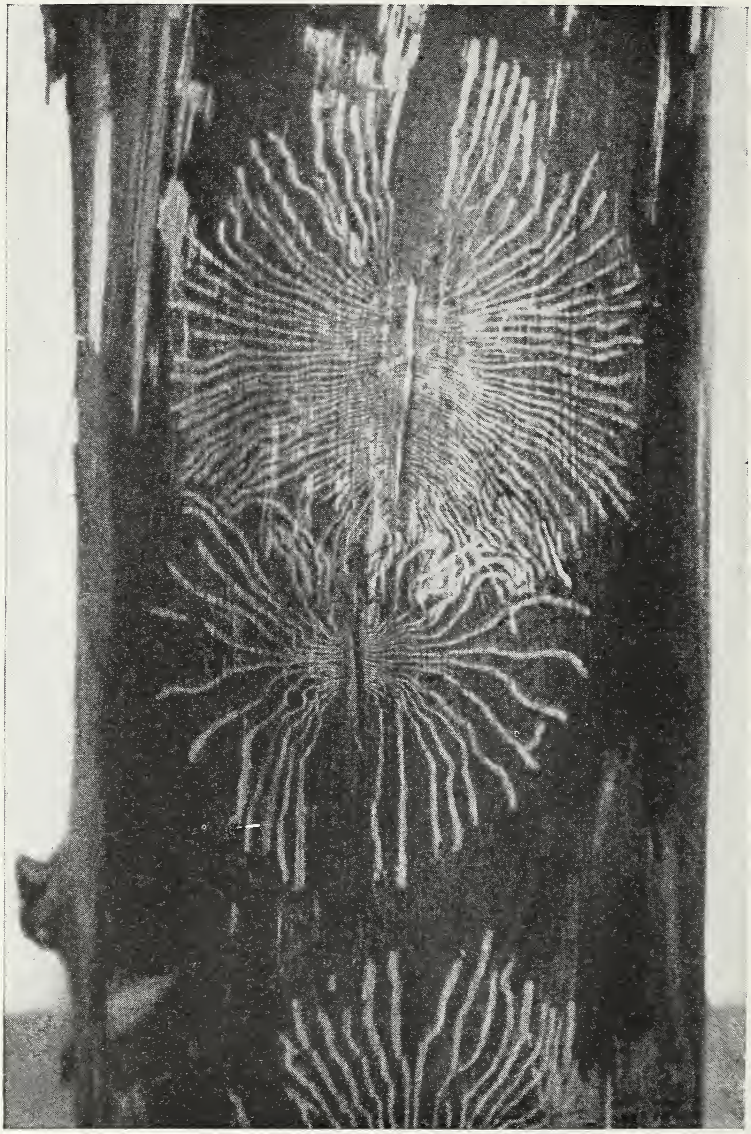

FIGURE 4.—Egg galleries and larval mines of the smaller European elm bark beetle on surface of wood (one-half natural size).

Natural Checks to Elm Bark Beetles

Numerous factors account for the death of elm bark beetles in their different stages. Other insects destroy them, and diseases caused by fungi and other organisms probably play a part in reducing their numbers. Certain birds remove them in the immature stages from the bark and use them as food, especially during the winter months.

Unusually low winter temperatures evidently kill many. Often the galleries are so numerous in suitable material that only a small percentage of the eggs that are laid develop to the adult stage. In spite of these factors the elm bark beetles persist and develop in large numbers in localities where there is an abundant supply of suitable food for the larvae.

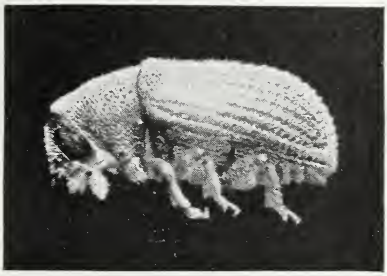

FIGURE 5.—Adult of the native elm bark beetle (× 15).

Controlling Elm Bark Beetles

The only known methods of controlling the elm bark beetles are to avoid the accumulation of material in which the larvae can develop and to destroy infested material before adults emerge. Such material includes recently cut elm logs and cordwood and elm trees or parts thereof which have recently died or are in a dying condition. Trees or parts of trees may become suitable for beetle attack because of

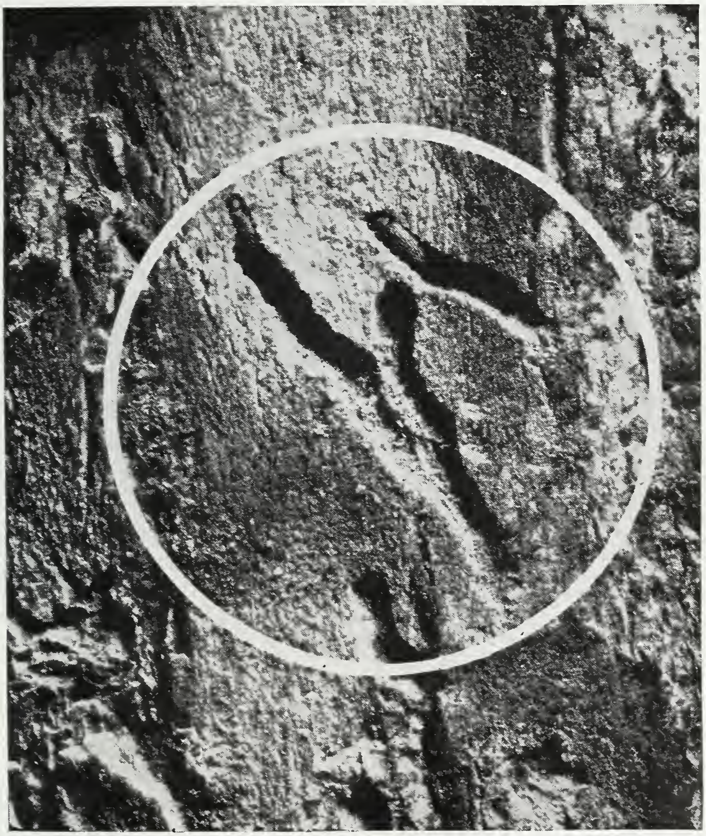

FIGURE 6.—Hibernating galleries containing adults of the native elm bark beetle in bark of elm (× 3).

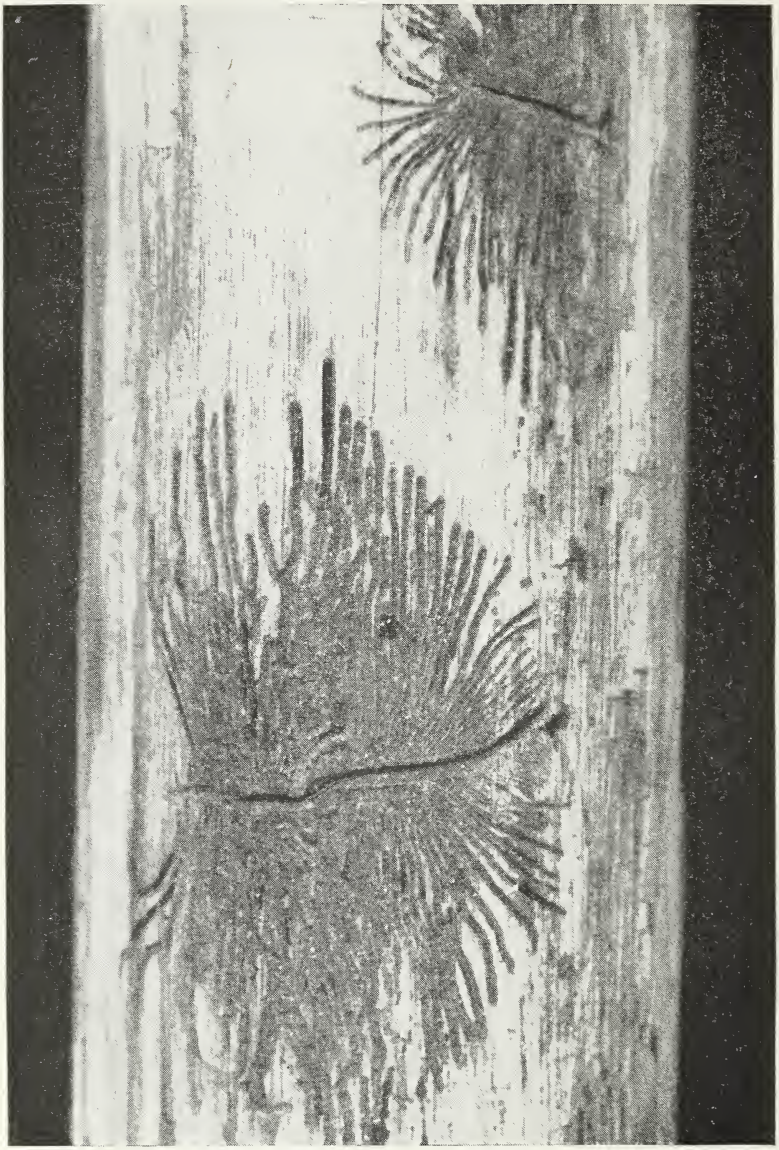

FIGURE 7.—Egg galleries and larval mines of the native elm bark beetle on surface of wood (three-fifths natural size).

disease, change of soil-water level, girdling, or storm injury. Removing the bark from logs, cordwood, and material used for construction and other purposes will of course prevent bark beetle attack, provided the bark is removed immediately after the trees are cut down.

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